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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/646,247 08/22/2003 Stuart Stephen Papworth Parkin

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EXAMINER

PRENTY, MARK V

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 07/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/646,247

Applicant(s)

PARKIN, STUART STEPHEN
PAPWORTH

Examiner

MARK V PRENTY

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-23 and 30-54 is/are allowed.
- 6) ☒ Claim(s) 24-26 is/are rejected.
- 7) ☒ Claim(s) 27-29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date April 19, 2004.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

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This Office Action is in response to the papers filed on August 22, 2003.

Claims 25 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 is indefinite because "the overlayer" lacks antecedent basis.

Claim 26 is indefinite because "the overlayer" and "the underlayer" lack antecedent basis.

Claims 24 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Takashima et al. (United States Patent 6,724,025 – hereafter Takashima).

With respect to independent claim 24, Takashima discloses a device (see the entire patent, including the Fig. 11A disclosure, for example), comprising: a first layer 14 that includes at least one magnetic material from the group consisting of ferromagnetic materials and ferromagnetic materials (i.e., strontium titanate (SrTiO_3), barium titanate (BaTiO_3), lead zirconate titanate ($\text{PbZr}_x\text{Ti}_{1-x}\text{O}_3$), for example (see column 12, lines 16-24), which are ferromagnetic materials¹), the first layer having a surface that is substantially free of oxide formed from the first layer; a MgO tunnel barrier 22 (see column 16, lines 65-66, and column 12, lines 34-41) on and in contact with the surface of the first layer; and a second layer 11 that includes semiconductor material (silicon), the second layer having a surface that is on and in contact with the MgO tunnel barrier, the MgO tunnel barrier being sandwiched between the first layer and the second layer.

¹ See Oowaki et al. (United States Patent 6,690,047) at column 16, lines 38-39.

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Claim 24 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Takashima.

With respect to dependent claim 25, the surface of Takashima's second layer 11 is substantially free of oxide formed from the second layer.

Claim 25, at least insofar as understood, is thus rejected under 35 U.S.C. 102(e) as being anticipated by Takashima.

Claims 27-29 are objected to as being dependent upon a rejected base claim, but would be allowable over the prior art of record if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1-23 and 30-54 are allowable over the prior art of record.

The prior art of record does not disclose or suggest the allowable device/method taken as a whole, including the MgO tunnel barrier.

Kirczenow (United States Patent 6,355,953) is relevant to this application.

Registered practitioners can telephone the examiner at (571) 272-1843. Any voicemail message left for the examiner must include the name and registration number of the registered practitioner calling, and the Application/Control (Serial) Number. Technology Center 2800's general telephone number is (571) 272-2800.


Mark V. Prenty
Primary Examiner